CHAPTER X

PRODUCT COST ACCOUNTING

1. GENERAL.

a. Purpose. This chapter outlines the principles and procedures to be followed by DOE and its contractors in developing and operating a cost accounting system for : (1) the procurement and production of uranium, thorium, nuclear material, weapons components and other products; (2) the recovery of unirradiated material and the chemcial processing of irradiated materials; (3) stockpiled weapons, weapons components and intermediate weapons products, and (4) weapons and weapons components delivered to DOD under Presidential Directives. Excluded from the production cost accounting system are any of the above-mentioned materials and the nuclear material portion of weapons components withdrawn from the production chain for use in research, process development, pilot plant operations, and weapons design, development and test activities. (See Chapter I, section 1, and Chapter V, section 6.) This Chapter also prescribes the basic standards for transferring accumulated costs of materials and weapons components to the field offices and contractors receiving such materials for further processing and assembly, and for transferring any nuclear material in other inventories.

b. Integration with Financial Accounts. The DOE product cost accounting system is integrated with the financial accounts and conforms to industrial cost accounting standards. Product inventories are classified as set forth in Chapter I, "Classification of Accounts, Definitions, and Coding Structure." Production costs are accumulated and transferred from field office to field office and from contractor to contractor as the product moves. (See section 8.)

c. Development of Detailed Procedures.

(1) Product Cost Accounting. Production contractors and field offices will base their detailed cost accounting procedures on the principles outlined in this section.

(2) Product Cost Transfers. Each field office is responsible for developing detailed procedures covering the internal handling of transfers of product costs within its jurisdiction and to and from other field offices. Procedural standards for the transfer of such costs are included in section 8.

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(3) Review by Controller. Field offices shall furnish one copy of each of their own and their contractors' detailed procedures, and all subsequent revisions to the Controller.

d. Elements of Product Cost. The elements of product cost listed below are to be included in both total and unit product costs and product cost transfers:

(1) Raw Materials includes all costs applicable to the procurement of uranium and thorium, treatment and processing to convert low-grade ores into concentrates, and transportation and other costs incurred in moving the materials to feed-processing plants. Such costs include depreciation.

(2) Feed Materials includes all costs of nuclear material transferred to a production process. Such costs include all prior conversion costs and depreciation.

(3) Direct Weapons Materials includes the cost of weapons materials, other than nuclear material or stores, received in a production area for fabrication or assembly into weapons components. For materials, parts, components or assemblies to be classified as direct weapons materials, their specifications must limit them exclusively to use in the manufacture of weapons or they must have been shaped or formed in a manner that results in their acquiring definite weapons characteristics. It must also be possible to measure the cost applicable to each unit of product or job.

(4) Process Materials includes the cost of all materials used in production processes or operations except materials designated in (1), (2), and (3), above.

(5) Direct Production Labor includes the cost of labor employed in the operation of a production process or in the fabrication or assembly of weapons components. For labor cost to be classified as direct, it must be possible to measure the cost applicable to each unit of product or job.

(6) Other Manufacturing Cost includes all other costs such as the following, except those costs listed in section 1e:

(a) Indirect Production Cost or Manufacturing Overhead includes the cost of all production services and superintendence, including depreciation, applicable to a production process or plant.

(b) Contractors' General and Administrative Cost includes all costs of a general and administrative nature, including fees and depreciation on administrative facilities incurred by contractors and chargeable to production operations.

(c) DOE Costs includes costs directly identifiable with and chargeable to production, such as laboratory test and assay costs, warehousing costs, inspection costs, and any other costs incurred by a DOE field office that are applicable to product.

(7) Transportation and Security Shipment Costs include all costs of transporting uranium, thorium, nuclear material, weapons components and other products to other contractors and locations, such as freight charges, salaries, and travel expenses of guards, etc., except cost of movements to or from stockpile. (See paragraph 1e(10).) These costs, while applicable to product inventories, are excluded from manufacturing or conversion costs in the procurement and production of nuclear material; however, they are included in the production cost of the product when transferred in accordance with paragraph 8c below. Transportation and security shipment costs incurred in the cascade complex, Albuquerque weapons complex, and contractors' intraplant transportation throughout the DOE production chain are included in manufacturing expense.

e. Costs Excluded from Product Cost and Costs Transferred. Because of the nature of the following costs and the practical problems involved, they are excluded from both total and unit product costs and product cost transfers and are expensed in the year incurred. However, such costs should be readily identifiable in the accounts so that they may be allocated to production, when necessary, to determine total costs.

(1) Process and Product Research and Development includes the costs of research and development work performed under the operating activities of DOE, including depreciation and nuclear material consumed, net of nuclear material produced in these activities.

(2) Education and Training includes all costs incurred, including depreciation, under the education and training activities.

(3) Community Assistance includes the net costs of functions performed under the community assistance activity, including depreciation.

(4) DOE Program Management and Support includes the costs incurred by DOE under the program management and support activities, including depreciation.

(5) Security Investigations include the costs incurred by DOE for personnel security investigations made by the Federal Bureau of Investigation and the Civil Service Commission.

(6) Standby Costs includes all costs incurred in conditioning production facilities for placement in standby condition and maintaining these facilities in a shutdown condition for possible future use. These costs include such items as guard force activities, heating, fire protection, electricity, general maintenance, and similar items, including a proper share of an operating contractor's general service and administrative expense, if any. Standby costs do not include the costs of excess capacity, costs of producing at less than normal or other level of capacity, or costs incurred during shutdowns for operating causes including process changes.

(7) Startup Costs includes all costs incurred for operational testing, training of operating staffs, and similar expenses involved in preparations for production operations of new facilities or reactivated standby facilities up to (a) the time when feed materials are introduced into the process or fabrication facilities with the intent to produce the plant product, or (b) the effective date of the production schedule developed by DOE production scheduler for products produced by facilities using all non-nuclear materials exclusive of normal uranium. When facilities are brought into operation in stages or piecemeal, the word "product" refers to any intermediate products or materials produced between the initial material and the final product of a plant.

(8) Transportation and Security Shipment Costs Applicable to Stockpile Transactions. Costs of transporting weapons parts, components and assemblies to and from stockpile, such as freight charges, salaries, and travel expenses of guards, etc., are excluded from product costs and inventories and are classfied as Production and Surveillance--Transportation. The cost of preparing items for shipment to stockpile by a contractor is charged to product cost.

(9) Costs Incurred Through Conversion of Weapons. The costs of modifications, repairs, retrofit and other support of nuclear weapons stockpile are excluded from product cost and charged to applicable stockpile maintenance activities on a procured basis.

(10) Shutdown Costs include all costs, such as termination pay, the cost of personnel who remain on payroll but whose functions are suspended or reduced, the cost of excess capacity, or the cost of producing at less than normal capacity, etc., caused by or attributable to a complete plant or major segment thereof being prepared for standby or removed from operation for an extended period of time. (The cost of producing at normal capacity is defined as the average cost representative of the most recent period of normal production.) The field office heads may designate the use of this account when they are directed to shut down plants for abandonment or for placement in standby for an indefinite period. However, prior approval of the Controller is required to use this account when the shutdown is of a temporary nature, such as time required for improvements. Increases in costs attributable to maintenance difficulties, mechanical failures, shortages of feed or other materials, or any other of the normal hazards of operation are not to be included in Other Costs--"Shutdown Costs."

(11) Inventory Adjustments and Revaluations includes any inventory adjustments or revaluations not of a routine or recurring nature which have been specifically authorized by the Controller to be excluded from product costs.

(12) Resources Evaluation includes all costs incurred in the development of uranium resources data.

(13) Costs Related to Waste Materials includes all costs associated with the processing, conversion, segregation, and filtering of waste materials and the packaging, transportation, decontamination, and storage costs related to waste management activities.

f. Unit Cost Determinations. Cost accounting methods best adapted to each type of process of manufacturing operation are employed in determining total and unit costs of products. Generally, these methods give effect to changes in work in process inventories since a portion of the costs incurred during any accounting period applies to units still in process at the end of the period. In making these determinations, the quantitative data available from the Nuclear Materials Management and Safeguards System and the assistance of the technical production staff are utilized to the extent possible.

(1) Continuous Process Operations. To obtain realistic unit costs in a continuous process type of operation, it is necessary to determine unit costs on the basis of effective or equivalent completed production for an accounting period. Effective production is the total number of units of product completed during the period plus or minus the change in the quantity of work in process inventories expressed in terms of equivalent

units of completed product. In converting work in process to equivalent units of completed product, consideration is given to the stage of completion of the individual elements of production cost. For example, when all feed materials enter a process at the start of the process, the full cost of feed materials in process is used in costing the work in process inventory. On the other hand, labor and overhead costs are applied throughout a production process, and these costs are included in work in process inventories on the basis of the stage of completion of the work. Bases for determining stages of completion of unfinished work are developed with the assistance of the technical production staff.

(2) Machining and Assembly Operations. These operations require either job order costs, average costs for each part and operation, or standard costs in determining unit costs and for costing work in process inventories. Labor and material costs usually are accumulated for individual jobs while overhead is applied on the most reasonable basis, depending on the type of operation and the contractor's accounting system.

g. Physical Inventories. Heads of field offices and Headquarters divisions and offices shall provide for and assure that each contractor under their jurisdiction maintaining weapons production inventories shall establish policies and procedures for the taking of physical inventories at least once each fiscal year. For the purposes of this Section, the materials specified section 4b, are not to be included in weapons production inventories. Physical inventories of direct weapons materials for which perpetual inventory records are maintained may be taken on a cyclical or rotating basis. Physical inventories of weapons work in process and furnished weapons components awaiting shipment shall be taken concurrently unless this would result in excessive interference with weapons production requirements. Hence, it may be necessary to defer the inventorying of that segment of the production inventory that would cause an excessive interruption in production operations if taken concurrently with the other segments of the inventory. In such a case, the inventory schedule should be arranged so that all weapons production inventories would be physically counted during the same fiscal year and within a period which would allow a ready reconciliation of differences between or among the several inventory classifications. Detailed procedures for the taking of physical inventories shall be reviewed and approved by the field office head who shall also be advised of the time schedule for the inventory taking in order to arrange any necessary DOE observation. Reconciliation schedules of the physical and book inventories shall be prepared, and appropriate adjustments made for all discrepancies after approval by a responsible official of the contractor and after the concurrence of the field office head. The field office head shall investigate, determine the cause of all significant discrepancies, and provide remedial measures to prevent their recurrence where possible.

h. Product Cost Reports. See Chapter XI, section 5.

2. TREATMENT OF SPECIFIC ITEMS OF COST.

a. Depreciation Expense in Product Costing. Problems in the treatment of depreciation in product cost accounting for the DOE production program result from present methods of budgeting and their effect on accounting. One problem is created because depreciation is not included in budget estimates and therefore is not reported as a cost incurred for comparison with the budget estimates as required by Chapter II. Another problem results from the sale of weapons components at the cost of work performed under the weapons program, exclusive of depreciation. The treatment of depreciation in production costs is outlined in the following paragraphs.

(1) Depreciation Applicable to Production Operations Other Than Weapons. Depreciation costs incurred during a period and applicable to each production process or operation (including depreciation directly associated with the process or operation and the portion allocated to the process or operation for contributing services, etc.) are determined and maintained separately for each process. Depreciation is segregated from other costs in transferring the cost of products from one plant to another.

(2) Depreciation Applicable to Weapons Operations. For production work performed under the weapons program, the applicable depreciation costs are determined and maintained separately from the other costs of production in product inventories and product cost transfers. Accounts necessary to accomplish this are indicated in the following paragraph.

b. Inventory Accounts for Weapons Production. Since it is necessary to segregate the costs of nuclear material, weapons operations, and weapons depreciation when accounting for sales of weapons components, the production inventory accounts are subdivided into these three cost elements.

c. Segregation of Costs. The cost records for weapons materials and components provide for unit cost data relative to nuclear material, depreciation applicable to direct weapons materials received, weapons operations performed, and products shipped, as well as for other production costs. Each product cost transfer document will show separately the amounts of nuclear material costs, weapons operations costs exclusive of depreciation, and depreciation costs applicable to the weapons program for each product transferred.

d. Nuclear Material Recycled and Weapons Parts Rejected.

(1) Nuclear material that does not meet specifications and is recycled in the process or that does not meet the feed requirements of another production process of operation within the same plant (other than a scrap recovery facility) is generally valued at an amount equal to the standard inventory cost to the process in which the material is recycled. Such material will be included in production inventories and not considered as material held for recovery and processing.

(2) Weapons parts rejected because of failure to meet specifications, but not nuclear material recycled in the process generating the rejected material, are returned to the shipper, reworked or scrapped. Generally, both nuclear and non-nuclear weapon parts that fail to meet specifications when received by transfer are returned to the transferor for correction. When it is impractical to return rejected parts and they can be reworked in the plant, the rework costs, if insignificant, will be absorbed by the plant performing the rework. When the transferor determines and notifies the recipient that the parts are to be scrapped, production inventory is to be credited for the cost of the parts and the nuclear material classified in accordance with section 9. The costs of the parts less salvage credits, if insignificant, will be absorbed by the plant where the parts are scrapped. The accounting system must at all times provide sufficient detail to assist responsible operating personnel in controlling costs that result from rejections and reworking of parts.

e. Uranium in Irradiated Production Fuels. The costs that are assigned to uranium in irradiated production fuels are equal to the standard inventory cost of recoverable UF_6 less the costs (estimated, if necessary) of transportation to and recovery at a chemical processing plant, transportation of the recovered material to the diffusion plant site and conversion to UF_6. Predetermined unit costs to be used in valuing these materials will be furnished by the field office head having jurisdiction over chemical processing operations based on cost data to be supplied by the Manager of the Oak Ridge Operations Office. Variances created by the processor because of differences between actual and predetermined yields and recovery costs are to be liquidated by revisions to the predetermined values to be used in subsequent periods. Periodically, the values of enriched and depleted UF_6 of various U-235 assays are revised to reflect standard inventory costs caused by changes in the costs of virgin UF_6 and separative work, and cascade operating conditions. Inventories of uranium in irradiated production fuel material shall not be revalued to give effect to the revised UF_6

standard inventory cost when the reactor product and the irradiated fuel are physically identifiable as individual products and cannot be directly associated with each other at one production site.

f. Cost of Special Tooling and Special Test Equipment. The cost of special tooling and special test equipment is charged to the product or the specific weapons program for which acquired. The cost of special tooling to be used on two or more programs is allocated to the applicable programs. If special tooling or special test equipment is acquired for and used on a specific program and later used on a another program, all costs are allocated to the first program. The cost of reworking or adapting to special tooling for use on a program other than that for which acquired is charged to the new program. Changes are accumulated as production-work-in-process inventory. Credits are computed so as to apply the cost on an equitable unit basis over the total production schedule. If changes in production schedules occur after a portion of the tooling costs have been amortized, the allocation rate is revised to apportion the remaining cost to the balance of production. There should be no adjustment of the cost of units that have been shipped. The cost of special tooling that is unamortized because of engineering changes or military cutbacks is charged to the appropriate category and excluded from product cost. (See section 1e.) The complexities of the DOE operations and processes, especially those related to the fabrication and assembly of weapons components, may require some flexibility in the above but it is intended that tooling costs be apportioned on an equitable unit cost basis. For further discussion n the subject of special tooling and special test equipment, see Chapter V, 1d(3) and Chapter VI, 4f(2)(c).

3. SALES OF PRODUCTS AND OTHER TRANSACTIONS.

a. Sales (Other Than Intra-DOE). When the sale of material or products other than weapons components sold to DOE is made by either a contractor or field office, the product inventory account is credited for the total production cost ofthe product and a nominal account charged for the cost of the product sold. the cost of account weapons components sold to DOE is credited to the product inventory. The reimbursable cost of the component or part sold is charged to a nominal account and nonreimbursable cost is recorded in the account, Nonreimbursable Transfers to Other Federal Agencies. Concurrently, the appropriate asset or working fund account is charged to record the receivable or the reduction of a liability and a nominal account is credited for the sales revenue. Additional instructions and procedures regarding the sale of products are contained in DOE 2100.0, "Pricing Handbook."

b. Returned Sales (Other than Intra-DOE). The accounting for the return of sales presents no problem if the products or materials

returned are in the same condition as when sold. If additional work is required to place the product or material in usable condition, it will be costed at current production cost less the cost of any work necessary to restore the product or material to WR quality or to product specifications for reentry into the production chain. If the cost of weapons components returned from DOD is not available, the last production cost of similar components may be used in costing the component returned.

c. Weapons and Weapons Components Returned to Contractors for Conversion. The cost of the component and the costs of the conversion operation are kept separate until the completion of the operation so that conversion cost exclusive of depreciation may be reported in accordance with Chapter II. Material, direct labor, and overhead costs applicable to the conversion operation are charged to the cost of conversion. Any recovered materials are charged to applicable inventory accounts and credited to conversion cost at the salvage value.

d. Materials Produced During Startup Operations. As indicated in section 1e(8) above, startup costs are excluded from product cost and product cost transfers; however, any materials produced in tests or trial runs during the period of startup operations are charged to the production inventory at the current production cost of comparable materials and credited to Startup Costs.

4. UNITS OF PRODUCT FOR COSTING AND REPORTING.

a. General. The units of product for cost determination and reporting are specified in 4b and c, below. The materials other than weapons components referred to in b., below, are the products of each major process or plant. The costing of intermediate products, when necessary for cost control purposes, may be requested by the field office head.

b. Materials Other Than Weapons Components.

(1) Raw Materials.

(a) Normal Uranium Material. Cost per kilogram of contained U_3O_8.

(b) Lithium Hydroxide. Cost per kilogram $LiOH-H_2O$.

Normal
Partially depleted (report each assay separately)

(c) Thorium Material. Cost per kilogram of contained thorium (report separately for each source).

(2) Feed and Special Nuclear Materials.

(a) Normal, Slightly Enriched and Depleted Uranium. Cost per kilogram of uranium.

Uranium nitrate (reactor-depleted only)
Orange oxide
Green salt
Reduced metal
Ingots
Rods
Machined slugs and tubular elements (by type)
Canned slugs and tubular elements (by type)
Irradiated uranium slugs and tubular elements
Uranium hexafluoride

(b) Thorium Materials. Cost per kilogram of contained thorium.

Thorium nitrate
Thorium nitrate solution
Thorium oxide
Thorium metal
Thorium billet
Canned slugs

(c) Enriched Uranium (U-235) and Plutonium. Cost per gram of uranium or plutonium.

Enriched uranium oxide
Enriched uranium hexafluoride
Enriched uranium tetrafluoride
Enriched uranium metal
Enriched uranyl nitrate
Irradiated enriched fuel elements returned from non-production reactors
Canned slugs and tubular elements (by type)
Plutonium contained in irradiated uranium slugs
Plutonium nitrate
Plutonium oxide
Plutonium metal

(3) Special Products. Cost in units applicable to each product as specified below.

Lithium-aluminum rods and slugs--kilogram of alloy
Irradiated Li-AL--gram of tritium
Deuterium--kilogram of D_2
Tritium--gram of tritium[2]
Enriched lithium--kilogram of Li
Enriched lithium chloride--kilogram of Li
Enriched lithium hydride--kilogram of Li
Enriched lithium deuteride--kilogram of Li
Enriched lithium metal--kilogram of Li
Normal lithium chloride--kilogram of Li
Normal lithium hydride--kilogram of Li
Normal lithium deuteride--kilogram of Li
Normal lithium metal--kilogram of Li
Neptunium in irradiated uranium elements--gram of Np
Neptunium in irradiated neptunium targets--gram of Np
Neptunium nitrate--gram of Np
Neptunium oxide--gram of Np
Neptunium billet fabrication--gram of Np
Neptunium slug fabrication--gram of Np
Neptunium finished slugs or extrusions--gram of Np
Plutonium-238 in irradiated neptunium targets--gram of Pu-238
Plutonium-238 nitrate--gram of Pu-238
Plutonium-238 oxide--gram of Pu-238
Plutonium-238 microspheres--gram of Pu-238
Uranium-233 contained in irradiated thorium targets--gram of U-233
Uranium-233 nitrate--gram of U-233
Uranium-233 oxide--gram of U-233
Uranium-236 mixed with other uranium isotopes--gram of U-236

(4) Production Byproduct Material.

(a) Lithium Tails. Cost per kilogram of contained $LiOH\text{-}H_2O$.

(b) Uranium Tails. Cost per kilogram of contained U.

c. Weapons Components. The unit of measure for weapons parts, subassemblies and assemblies is usually the "piece-parts"; however, the ingredients of High Explosive (HE) lots and some other materials, e.g., plutonium and tritium, may be in units of measure other than piece-parts. Transfers of product to the stockpile and to the DOD are measured in terms of units shipped which may consist of an assembly or group of assemblies. Specific items or piece-parts are not enumerated here since the items produced are continually changing.

RESERVED

5. WEAPONS STOCKPILE.

a. General. The stockpile inventory consists of DOE accepted completed weapons, weapons entities (noses, shapes, basic assemblies) and base spares located at various DOD sites, or awaiting shipment to the DOD sites at the DOE final assembly plant. Separate accounting controls are maintained by the Albuquerque Operations Office for inventories in the custody of DOD and for those in the custody of DOE.

b. Records.

(1) Completed Weapons and Weapons Components. Supporting detail (magnetic tape) shows the completed weapons and weapons entities by part number, serial number, and costs. The inventory is kept by serial number on a perpetual basis with the cost of each weapon or component segregated into its nuclear material, weapons operations, and depreciation costs. (See section 6 below, for accounting for the cost of items lost or destroyed while in the custody of DOD.) When a completed item is delivered to stockpile, its costs are transferred to the Albuquerque Operations Office by the contractor at the cost recorded on his books. When an item is withdrawn from stockpile and returned to a contractor, its cost is transferred to the contractor by the Albuquerque Operations Office at its stockpile inventory cost. If the item is returned to the contractor for retirement, the weapons operation and depreciation costs are charged to the Production and Surveillance Cost of Operations account at the stockpile cost, and the nuclear materials contained in the item are charged to the nuclear material inventory account at standard inventory cost. Losses due to the decay of tritium are also accounted for by the contractor and are reported as such at the end of the fiscal year. If the item is returned to the contractor for modification, conversion, or stockpile sampling and is to be redelivered to stockpile, the contractor charges the production inventory account with the stockpile cost. Items returned to the contractor for sampling are redelivered to stockpile at the stockpile cost. See section 3, for the costing of items returned to the contractor for modification or conversion and redelivery to stockpile.

(2) Base Spares. Base spares usage is charged to cost of operations. The usage is equal to the beginning inventory plus net deliveries to stockpile minus the ending inventory.

The physical inventory of these items is the responsibility of the DOD. Annually, a summary of the inventory is furnished to the Albuquerque Operations Office to be costed for yearend statement purposes.

6. WEAPONS UNDER PRESIDENTIAL DIRECTIVE.

a. General. The cost of completed weapons and weapons components delivered to DOD by DOE under Presidential Directive is included in the stockpile account. This account is credited for the original cost of the completed weapons and weapons components that are lost or destroyed while in the custody of DOD or returned to DOE for retirement or modification purposes. See section 3 and section 5, for method of accounting for items retired or modified. Completed weapons and weapons components lost or destroyed while in the custody of DOD are reported and accounted for by DOD by means of a Certificate of Expenditure. The original cost of the weapons or weapons components lost or destroyed is charged on Albuquerque's accounting records to Production and Surveillance Cost of Operations.

b. Supporting Records. The accounting records for weapons under Presidential Directive shall be maintained by the Albuquerque Operations Office as Stockpile Inventory.

7. NON-PRODUCTION NUCLEAR MATERIAL.

a. General. Nuclear material withdrawn from the production chain for use in research, non-production reactor fuels, process development, pilot plant operations, and weapons design, development and test activities are credited to production inventory at production cost as defined in section 1d and charged to appropriate accounts as explained in Chapter V, section 6.

b. Weapons Components Transferred to Research Activities. See Chapter V, section 6.

c. Weapons Components Returned to Production Inventories. See Chapter V, section 6.

8. PROCEDURAL STANDARDS FOR TRANSFER OF PRODUCT COSTS.

a. Transfer Voucher (DOE Form CR-325).

(1) General. All transfers of product by DOE offices and contractors maintaining product inventory accounts are made by means of a Transfer Voucher, DOE Form CR-325 (see Chapter III, section 2).

(2) Authorized Receivers of Transfer Vouchers of Product Cost. It is the responsibility of each field office to keep all other field offices advised of the names and mailing addresses of each of its contractors authorized to receive product cost transfer vouchers and the names and mailing addresses to be used for those contractors or installations receiving shipments of products but not authorized to receive product cost transfer vouchers. For security reasons, transfer vouchers are not to accompany shipments under any circumstances.

b. Preparation of Vouchers.

(1) Information Shown on Voucher. Generally, one voucher is used for each shipment and contains a reference to the DOE material transfer document number DOE/NRC Form 741. Transfer vouchers of product cost do not indicate quantities or unit costs. If more than one item of product is included on one material transfer document, the voucher identifies each item by use of a lot, batch, container, or item number and shows the total cost transferred for each item. Each item on a DOE Form CR-325 must be readily identifiable with the matching item on the DOE/NRC Form 741, Material Transfer Document. Classified stockpile or part numbers are not to be used for identification purposes. Shippers will assign a separate series of transfer voucher numbers for each field office of contractor authorized to have product costs using the transfer voucher code of the shipper and receiver. (See Chapter III, section 2.)

(2) Combining Shipments on One Voucher. Under conditions that are mutually agreeable and advantageous to shipping and receiving production contractors and to participating DOE field offices, the issuance of a separate transfer voucher or product cost for each individual shipment may be modified by written agreement among the parties concerned to permit the use of a single product cost transfer voucher to cover more than one shipment.

c. Pricing of Transfer Vouchers of Product Cost.

Transfers are priced at the standard inventory cost as determined by the Office of the Controller. The variance between actual and standard inventory cost of shipments from production contractors is to be charged to account 1629, Nuclear Material Inventory Variance, as described in Chapter V, section 6.

d. Monthly Cutoff Dates. See Chapter III, section 2.

e. Shipping Contractor's Procedure. The shipper generally prepares a transfer voucher covering each shipment. Each contractor's internal shipping procedure should provide for daily transmittal of copies for shipping memoranda to the product cost accounting section where transfer vouchers are prepared. After preparation and approval of the voucher, distribution is made as set forth in Chapter III, section 2. The copy retained is used as a source document for an accounting entry debiting the field office current account for product shipments and crediting a product inventory account and subsidiary records.

f. Receiving Contractor's Procedure.

(1) General Procedure. When the transfer voucher is received, the receiving contractor matches and compares it with a receiving report. It is then used to make an entry debiting a product inventory account and subsidiary records, and crediting the appropriate field office current account for product materials.

(2) Measurement Differences. In the case of nuclear materials, the receiver records the costs indicated by the shipper's transfer voucher and supporting documents. If the measurements of the receiving contractor reveal significant shipper-receiver differences, the dollar amount of such differences may be recorded in a subsidiary feed materials inventory account, Weight and Assay Adjustments. As a general rule, the balance in this account should be liquidated in the current period by a charge or credit to the cost of feed materials put into work in process. In those instances where feed materials inventories are being increased substantially or where a feed materials inventory is built up prior to the start of operations, such differences may remain in the feed materials inventory account until subsequent periods of operation.

(3) Overages, Shortages, and Returns. For all product materials including weapons parts and components, the receiving contractor should initiate a transfer voucher to charge or credit the shipper for the cost of any differences in the number of containers or pieces received or for any defective parts received and returned.

(4) In-Transit Shipments. When final transfer vouchers for the month are received but the materials or products have not been received by the last calendar day of the month, the voucher is marked "In-Transit" and used to charge an inventory in-transit account and credit the field office current account for product materials. The voucher is then held in an in-transit file pending receipt of the materials and the corresponding receiving reports. It will then be processed in the usual manner crediting an inventory in-transit account and charging a product inventory account and the subsidiary records.

g. DOE Field Offices' Procedures.

(1) Shipper's Field Office. Upon receipt of the product cost transfer voucher from the shipper, the DOE field office makes an accounting entry debiting the DOE Transfers Received account with the receiver's field office, and crediting the shipper's current account for product shipments.

(2) Receiver's Field Office. The receiver's DOE field office receives the transfer voucher from the shipper and makes an accounting entry debiting the receiving contractor's current account for product materials and crediting the DOE Transfers Received account with the shipper's field office.

(3) Shipper's and Receiver's Field Office. When one DOE field office is administratively responsible for the operations of both shipper and receiver, the above procedure is incorporated in the detailed procedures developed by the field office.

h. Non-Integrated Production Contractors and DOE Warehouses. When the shipper or receiver is a non-integrated contractor or a DOE-operated warehouse, the same procedure as indicated in sections 8e and f, above, is followed, except that the field office makes all necessary accounting and cost entries. Unit cost data for pricing transfer vouchers are furnished to non-integrated contractors and DOE warehouses by the heads of field offices. Alternate procedures, if desirable in specific cases, may be developed and used after approval by the Controller.

i. Transfers To and From Non-Production Nuclear Material Inventories.

(1) General Procedures. Contractors who are not also production contractors are not to be given copies of cost transfer vouchers covering materials they receive nor are they to be provided with unit product costs unless authorized by the Controller or appropriate designee. When material is shipped to and retained by a transferee for its own use, the recipient exercises discretionary judgment as to the disposition or use of the material. If the material is shipped solely for the performance of specific services by the recipient, as requested by the transferor, and is to be returned to the transferor upon completion of these services, the transferor retains authority to exercise discretionary judgment as to the disposition or use of such material. In either instance a transfer of cost is effected, and the recipient is responsible for maintaining and reporting the inventory value of the material.

(2) Pricing. Nuclear material received from the production chain are priced in accordance with Chapter V, Section 6. The weapons operational costs and weapons depreciation costs that are transferred for research purposes are charged to expense by the transferee and no longer accounted for as inventory. (See section 7 above.) Materials returned to the production chain are priced at the cost of the material in the inventory provided they can reenter the production processes without further work. The transfer price is reduced by the costs to be incurred in making the material acceptable to reenter the production processes. Recoverable scrap materials are transferred at established salvage values. (See Section 9 below.)

9. UNIRRADIATED NUCLEAR MATERIAL HELD FOR PROCESSING.

a. General. Unirradiated recoverable material that is in the plant or process generating it or in storage or stock awaiting recovery or shipment to a recovery facility shall be included in the account, Unirrdiated Nuclear Material Held for Processing. Material to be recycled within the process or usable in its present form as feed to a production process is to be excluded. (See section 2d.) Feed material to a scrap recovery facility shall be included; however, work in process in such a facility is considered to be part of the production chain. When the material enters the production chain, the appropriate cost is credited to the account, Unirradiated Nuclear Material Held for Processing, and charged to the account, Production Inventory.

b. Costing.

(1) General. Costs are assigned to these materials only when a recovery process has been developed for them and the costs of

the recovery process can be determined on a basis acceptable to the Controller. Generally, no cost will be assigned when material has no foreseeable use or when the cost of recovering the material exceeds its value. In determining the economics of recovery, consideration should be given to the accumulation of small quantities of like material at the recovery plant or other locations until a sufficient amount is available for economical recovery.

(2) Current Costs.

(a) Production Scrap. Costs shall be assigned to waste and scrap material as they are created and the salvage value credited to the process or operation generating the material. Costs assigned to these materials are equal to the standard inventory cost of the nuclear material to be recovered less the cost (estimated, if necessary) of recovery and transportation to the point of entry in the production chain. The cost of waste and scrap materials discarded or sold, together with process losses, are included in the cost of the process or operation where the loss occurs, as are credits from the sale or transfer of such material.

(b) Non-Production Nuclear Material Scrap. Scrap generated in the Non-Production Nuclear Materials Inventories is costed to the account, Unirradiated Nuclear Material Held for Processing, at the current production cost of transfer value less the cost of recovery and transportation to the point of entry in the production chain.

(c) Revised Values. Periodically, the transfer values of recoverable waste and scrap materials are revised to reflect predetermined salvage values developed in accordance with (3) below. Inventories of such material at all locations will be revalued in accordance with such values. Resulting adjustments to inventory values are accounted for as charges to the operations generating the scrap.

(3) Predetermined Salvage Values. Heads of field offices having jurisidication over installations performing scrap recovery operations are responsible for supplying other heads of field offices with predetermined salvage values for the various classes of recoverable scrap material. A list of values for classes of recoverable material generated and recovered in routine production operations should be furnished periodically to installations generating such material. Cost data required for valuing non-routine recoverable materials should be

requested from the heads of field offices performing recovery operations. Variances created by the scrap processor because of differences between actual and predetermined yields and recovery costs are to be liquidated by revisions to the predetermined salvage values in subsequent periods. Variances shall not be transferred retroactively to the installations generating the material.

(4) Recovery Costs. The recovery costs for each type of waste, scrap, and recoverable material are developed for use in establishing predetermined salvage values and for management consideration as to whether materials will be recovered, scrapped, or sold. Such costs shall give effect to the yield of good material from each type of waste and scrap as well as the production costs of the recovery processes. Recovery costs include transportation expenses to and from the plant recovering the material.

c. Supporting Records. Unirradiated nuclear material held for processing shall be supported by subsidiary records for quantity and value that identify and account for material by classifications of type, isotopic composition and grade.

10. PRODUCTION BYPRODUCT MATERIAL. Uranium tails and lithium tails that are not scheduled for recycle shall be charged to the account, Production Byproduct Material, at the cost at which it was received or transferred from another inventory. The average cost of the type and form of material shall be used to credit this account when the material is sold, shipped, scrapped, put to use in a non-production project, or scheduled for production.

11. NUCLEAR MATERIAL INVENTORY VARIANCE RETAINED BY FIELD OFFICES (ACCOUNT 1628).

a. Types of Variances.

(1) Standard Production Cost Variances. The variances of production contractors who use standard costs in some or all of their production operations. The variance represents the differences between the standard production cost or standard recovery cost and the actual production or recovery cost.

(2) Inventory Adjustment Variance. This variance may be retained in this account by non-production field offices with prior approval from the office of the Controller. Field offices may be given approval to maintain this variance because of unusual circumstances. The variance represents the difference between the current standard inventory cost and historical cost. (Currently for Pittsburgh Naval Reactor Office use only.)

b. Variance Distribution. The standard production cost variance will be considered by the field office when developing new standard costs for production and recovery operations. New production standards should contain the following two factors:

(1) A standard base rate representing estimated current production costs, and

(2) A variance factor which will virtually eliminate the accumulated variance.